

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in this application.

**Listing of Claims:**

Claims 1-75 (Canceled).

Claim 76 (Previously Presented): In a method of x-ray imaging using an intensifying screen to receive x-rays and emit light to be recorded on an x-ray film, a method of calculating from ~~a the~~ film image density an ~~the~~ energy which was imparted to the intensifying screen, comprising ~~the~~ steps of:

calibrating the film and intensifying screen by measuring ~~a the~~ response of the film and intensifying screen to a plurality of different intensities of received x-rays;

fitting a theoretical model of an ~~the~~ expected response to the measured response, and using the fitted theoretical model to calculate the imparted energy from ~~the~~ image density,

wherein the theoretical model is a serpentine curve of the form:

$$\underline{x^2 y + a^2 y - b^2 x = 0,}$$

where  $a$  and  $b$  are constants,  $x$  is a logarithm of the energy imparted to the intensifying screen and  $y$  is the image density.

Claim 77 (Canceled).

Claim 78 (Currently Amended):     In a [[A]] method of x-ray imaging using an intensifying screen to receive x-rays and emit light to be recorded on an x-ray film according to claim 76, a method of calculating from a film image density an energy which was imparted to the intensifying screen, comprising steps of:

calibrating the film and intensifying screen by measuring a response of the film and intensifying screen to a plurality of different intensities of received x-rays;

fitting a theoretical model of an expected response to the measured response, and using the fitted theoretical model to calculate the imparted energy from image density,

wherein the response of the film and intensifying screen to a plurality of different intensities of received x-rays is measured by exposing the film-screen combination to x-rays through a lucite step wedge and measuring the image density produced by the exposing exposure through the different steps of the wedge.

Claim 79 (Currently Amended):     Apparatus for calculating from image densities of an x-ray film image the energy which was imparted to an intensifying screen used to receive x-rays and emit light to be recorded on the x-ray film, the apparatus comprising:[[ - ]]

fitting means for fitting a theoretical model of the expected response of the x-ray film and intensifying screen to a plurality of different intensities of received x-rays to a measured response, and

calculation means for using the fitted theoretical model to calculate the imparted energy from the image density,

wherein the theoretical model is a serpentine curve of the form:

$$\underline{x^2 y + a^2 y - b^2 x = 0,}$$

where  $a$  and  $b$  are constants,  $x$  is a logarithm of the energy imparted to the intensifying screen and  $y$  is the image density.

Claim 80 (Canceled).

Claim 81 (Currently Amended): A computer program storage medium readable by a computer system and encoding a computer program for controlling a computer to calculate from image densities of an x-ray film the energy which was imparted to an intensifying screen used to receive x-rays and emit light recorded on the x-ray film, by a method comprising ~~the~~ steps of:

fitting a theoretical model of an ~~the~~ expected response of the x-ray film and intensifying screen to a plurality of different intensities of received x-rays to a measured response, and using the fitted theoretical model to calculate the imparted energy from ~~the~~ image density,

wherein the theoretical model is a serpentine curve of the form:

$$\underline{x^2 y + a^2 y - b^2 x = 0,}$$

where  $a$  and  $b$  are constants,  $x$  is a logarithm of the energy imparted to the intensifying screen and  $y$  is the image density.

Claims 82-100 (Canceled).

Claim 101 (Currently Amended): A method of calculating from a mammogram a ~~the~~ compressed thickness of an ~~the~~ imaged breast, comprising a ~~the~~ step of delimiting in the

mammogram ~~a~~ the region corresponding to ~~a~~ the part of the breast which is compressed from ~~a~~ the region corresponding to an ~~the~~ uncompressed breast edge by detecting the smoothness of curves of equal intensity in the mammogram.

Claim 102 (Currently Amended): A method according to claim 101, further comprising ~~the~~ steps of detecting ~~a~~ the smooth equal intensity curve which is positioned furthest from the breast edge, calculating from ~~the~~ intensities along that curve ~~a~~ the thickness of fat in the breast which gives those intensities, and calculating the thickness of the compressed breast from that thickness of fat.

Claim 103 (Currently Amended): A method according to claim 101, comprising as an initial step ~~a~~ the conversion of the mammogram into an ~~the~~  $h_{int}$  representation representing the thicknesses of fat and interesting tissue in regions of the breast contributing to each point in the mammogram.

Claim 104 (Previously Presented): A method according to claim 103, wherein the conversion is performed on the basis of an underestimate of the compressed breast thickness, the conversion being iterated with successively changing estimates of the compressed breast thickness until a smooth delimitation between the region corresponding to the part of the breast which is compressed and the region corresponding to the uncompressed breast edge is found.

Claim 105 (Currently Amended): A method according to claim 101, wherein a predefined smoothness threshold is set to detect ~~the~~ smooth curves.

Claim 106 (Currently Amended): A method of calculating ~~a the~~ contribution to a mammogram of extra-focal radiation by calculating the compressed thickness of the imaged breast according to the method of claim 101, calculating from an the x-ray exposure and an estimate of ~~the~~ scattering of radiation an the expected intensity in the mammogram along the delimitation between the region corresponding to the part of the breast which is compressed and the region corresponding to the uncompressed breast edge, and comparing the expected intensity to an the actual intensity in the mammogram.

Claim 107 (Currently Amended): Apparatus for calculating from a mammogram ~~a the~~ compressed thickness of an the imaged breast, comprising means for delimiting in the mammogram ~~a the~~ region corresponding to ~~a the~~ part of the breast which is compressed from ~~a the~~ region corresponding to an the uncompressed breast edge by detecting ~~the~~ smoothness of curves of equal intensity in the mammogram.

Claim 108 (Currently Amended): Apparatus according to claim 107, further comprising detection means for detecting a ~~to detect the~~ smooth equal intensity curve which is positioned furthest from the breast edge, and calculating means for calculating from ~~the~~ intensities along that curve ~~a the~~ thickness of fat in the breast which gives those intensities, and for calculating the thickness of the compressed breast from that thickness of fat.

Claim 109 (Currently Amended): Apparatus according to claim 107, further comprising conversion means for converting the mammogram into an the  $h_{int}$  representation

representing ~~the~~ thicknesses of fat and interesting tissue in regions of the breast contributing to each point in the mammogram.

Claim 110 (Previously Presented): Apparatus according to claim 109, wherein the conversion means first underestimates the compressed breast thickness, and iterates the conversion with successively changing estimates of the compressed breast thickness until a smooth delimitation between the region corresponding to the part of the breast which is compressed and the region corresponding to the uncompressed breast edge is found.

Claim 111 (Currently Amended): Apparatus according to claim 107, wherein a predefined smoothness threshold is set to detect ~~the~~ smooth curves.

Claim 112 (Currently Amended): Apparatus for calculating a ~~the~~ contribution to a mammogram of extra-focal radiation comprising apparatus according to claim 107 for calculating the compressed thickness of the imaged breast, and further comprising expected intensity calculating means for calculating from an ~~the~~ x-ray exposure and an estimate of ~~the~~ scattering of radiation an ~~the~~ expected intensity in the mammogram along the delimitation between the region corresponding to the part of the breast which is compressed and the region corresponding to the uncompressed breast edge, and comparing means for comparing the expected intensity to an ~~the~~ actual intensity in the mammogram.

Claim 113 (Currently Amended): A computer program storage medium readable by a computer system and encoding a computer program for controlling a computer to calculate from

a mammogram ~~a the~~ compressed thickness of ~~an the~~ imaged breast by a method comprising ~~a the~~ step of delimiting in the mammogram ~~a the~~ region corresponding to ~~a the~~ part of the breast which is compressed from ~~a the~~ region corresponding to ~~an the~~ uncompressed breast edge by detecting ~~the~~ smoothness of curves of equal intensity in the mammogram.

Claim 114 (Currently Amended): A computer program storage medium according to claim 113, wherein the method further comprises ~~the~~ steps of detecting ~~a the~~ smooth equal intensity curve which is positioned furthest from the breast edge, calculating from ~~the~~ intensities along that curve ~~a the~~ thickness of fat in the breast which gives those intensities, and calculating the thickness of the compressed breast from that thickness of fat.

Claim 115 (Currently Amended): A computer program storage medium according to claim 113, wherein the method further comprises as an initial step ~~a the~~ conversion of the mammogram into ~~an the~~  $h_{int}$  representation representing ~~the~~ thicknesses of fat and interesting tissue in regions of the breast contributing to each point in the mammogram.

Claim 116 (Previously Presented): A computer program storage medium according to claim 115, wherein the conversion is performed on the basis of an underestimate of the compressed breast thickness, the conversion being iterated with successively changing estimates of the compressed breast thickness until a smooth delimitation between the region corresponding to the part of the breast which is compressed and the region corresponding to the uncompressed breast edge is found.

Claim 117 (Currently Amended): A computer program storage medium according to claim 113, wherein a predefined smoothness threshold is set to detect ~~the~~ smooth curves.

Claim 118 (Currently Amended): A computer program storage medium readable by a computer system and encoding a computer program for controlling a computer to calculate a ~~the~~ contribution to a mammogram of extra-focal radiation by calculating the compressed thickness of the imaged breast according to the method of claim 101, calculating from an ~~the~~ x-ray exposure and an estimate of ~~the~~ scattering of radiation an ~~the~~ expected intensity in the mammogram along the delimitation between the region corresponding to the part of the breast which is compressed and the region corresponding to the uncompressed breast edge, and comparing the expected intensity to an ~~the~~ actual intensity in the mammogram.

Claims 119-131 (Canceled).

Claim 132 (New): Apparatus for calculating from image densities of an x-ray film image the energy which was imparted to an intensifying screen used to receive x-rays and emit light to be recorded on the x-ray film, the apparatus being controlled in accordance with a control program to fit a theoretical model of the expected response of the x-ray film and intensifying screen to a plurality of different intensities of received x-rays to a measured response, and to use the fitted theoretical model to calculate the imparted energy from image density,

wherein the theoretical model is a serpentine curve of the form:

$$x^2y + a^2y - b^2x = 0,$$



where  $a$  and  $b$  are constants,  $x$  is a logarithm of the energy imparted to the intensifying screen and  $y$  is the image density.

Claim 133 (New): Apparatus for calculating from a mammogram a compressed thickness of an imaged breast, the apparatus being controlled in accordance with a control program to delimit in the mammogram a region corresponding to a part of the breast which is compressed from a region corresponding to an uncompressed breast edge by detecting smoothness of curves of equal intensity in the mammogram.